

## THE USE OF GEOLOGICAL INFORMATION TO DESCRIBE COAL MINE ROOF CONDITIONS.

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Since bad mine-roof conditions directly affect mine production and safety, it is important to be able to detect or identify the location of areas where such conditions are likely to be encountered in undeveloped portions of coal reserves. From our studies of the geology associated with the coal seams in our Cambria Division mines in central Pennsylvania as well as from discussions with our coal mine operators, we worked out a model based on geological variables that will make it possible to identify areas of potentially bad mine-roof conditions prior to mining. The geological factors in this model are: the intensity, direction and extent of surface fractures as determined from aerial photographs; the nature and thickness of the strata immediately above the coal seam; the thickness of the overburden; and the presence and extent of ancient stream-channel deposits. Taken together, these geological factors in a conventional mine-development plan should make it possible to assign a relative ranking of the roof conditions that are likely to be found as mining progresses over the extent of the coal reserve. Of course, quantification of this ranking will require a thorough knowledge of the independent role of each of the geological variables in mine-roof conditions, and this will be accomplished as mining advances over a larger portion of the area under study. Once the required information is obtained, the model will not only enable us to pinpoint the location of bad mine roof in coal reserves but should ultimately provide the guidelines for working out mine-development plans that will result in optimum productivity and maximum safety throughout the life of the coal reserve.